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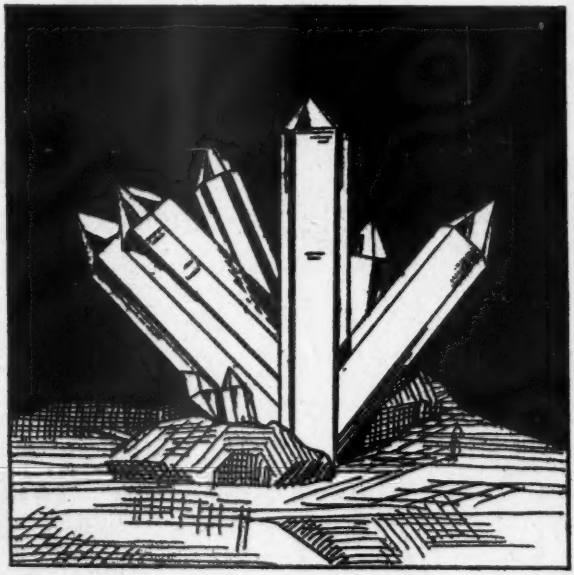
ROCKS AND MINERALS

A Magazine For Mineralogist, Geologist & Collector



OFFICIAL JOURNAL OF

THE ROCKS AND MINERALS ASSOCIATION

PUBLISHED MONTHLY JANUARY, 1935

THE BULLETIN BOARD

New Location

Under the caption "We are Expanding," we announced in our June, 1934 issue, that we had moved to a new location at 1100 Elm Street, where we had greater facilities for exhibiting our minerals and rock specimens. It was a pleasant location but somewhat out of the way for members of the Association who might be passing through Peekskill. Also we were somewhat remote from the Post Office. We have, therefore, removed our offices to 1011 Park Street, in the center of the business district of Peekskill.

Those passing through the city may turn east at Park Circle, which joins the main thoroughfare, and drive only a short distance in that direction. Our offices will be found on the south side of the street, on the second floor of the Diamond Building.

This has proved a most desirable change, for already many more of our friends have stopped in to see us and those desiring mineral specimens have found us more accessible. Our mailing address is Box 29, Peekskill, New York.

You and your friends when passing through Peekskill are invited to call at our office. You will be assured of a most cordial and friendly greeting with an opportunity extended to you to enter your name in our Register of Visitors.

Best wishes for the New Year to our friends.

ROCKS *and* MINERALS

The Association Pin

Of the designs submitted for an Association pin, that of Mr. Arthur A. Grott of New York City has been accepted by the committee as being the most appropriate. This is a very handsome pin. Waving ribbons forming the shield bear across the top, "Rocks and Minerals Ass'n"; on the left side the word "Granum" and on the right, "Aurum," with "Est. 1928" at the bottom. The center of the pin represents a compass face with two mineralogical hammers, crossed, lying upon it. We are very sure that everyone will be much pleased with the pin and after securing prices from manufacturing jewelers, we will then announce the cost to members.

The prize offered for the best design submitted, a specimen of iridescent obsidian, from Stauffer, Oregon, has forwarded to Mr. Grott.

ROCKS and MINERALS

A MAGAZINE FOR MINERALOGIST, GEOLOGIST AND COLLECTOR

PUBLISHED MONTHLY — FOUNDED 1926

VOL. 10, NO. 1 — WHOLE NO. 43

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ROCKS and MINERALS

Edited and Published by Peter Zodac

PUBLISHED MONTHLY

The Official Journal of the Rocks and Minerals Association

JANUARY 1935

VOL. 10, No. 1

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Petrified Woods of Central Oregon

By P. L. FORBES

Although many articles have been written concerning the petrified forests of the world, the writer believes that none of them can have such a variety of petrified wood in the forest as can the one found near Elk Butte, Stauffer, Oregon. The petrified forest of Arizona is classified as the largest forest in the world, but it is all of the agatized class of woods. This new find, has opalized, agatized, jasperized, cherty and with some specimens only partly hardened, some logs which have decayed or been burned before or after being buried and replaced by translucent, white and banded chalcedony agate; some also that are only partly decayed with chalcedony replacements having taken place. A few logs have been found where the entire log is green agate, or plasma, showing the rings of growth. Some people will not believe that the translucent agate variety was wood replacement, but when one sees the knots, etc. on them, he soon changes his mind.

Another peculiar thing about some of this wood, is that it has green bark, due to the fact that it is found in a rather hard, green clay or rock. One of the most beautiful varieties is called the Black Fringed Oak Wood. It shows very plainly, the rings, pores and growth of oak, while around the outer edge is a beautiful fringe of jet black agate, about ½" deep. This is usually very solid and takes a fine polish. It is found a few miles from where the green bark variety is located. In this so-called oak forest is also found a few petrified bones, probably of deer, but one cannot find enough of them to fully determine what animal it was that was thus covered up by the forest. In this same place are also found a few pieces of what had been dead wood, full of worm holes, the holes being now filled or partly filled with agate. One can see as many as 10 worm holes in a square inch. The partly filled holes contain beautiful small crystals when examined with a magnifying glass.

Another odd replacement is logs of chert. These are always found just below and joining the chalcedony replacement where the logs have been in a vertical position. The chert has no beauty to it as it usually is a dull yellow, sometimes with a greenish cast to it, owing to the formation around it.

What is classed as the most beautiful of all, is the jasperized wood. Here one can see, brown, red, black, green, white, yellow and several other shades of translucent agate all in the same log, but it is more or less checked and the green being usually of a porphyry which spoils it for polishing, although I have cut several pieces and given them a coat of varnish. They then show up beautifully.

In this same forest are found a few pieces of roots or limbs, about 2 to 5" in diameter which look as though they had been split in half, and showing the grain of the wood. They are usually agates, some with quartz crystals in them and a few with calcite crystals mixed with the crystals of quartz. No mineralogist or geologist has been able to explain this formation but recently the writer had the opportunity of digging out one which showed that the root or limb had lain in a horizontal position when covered up ages ago. In time the wood had decayed, burned or dissolved in some manner and chert had formed in the lower half, and the agate had replaced the remaining space. The agate and chert do not seem to want to adhere to each other. In another place near by one can see the same replacement except that the lower half is a sort of jasper and the upper half agate, joined tightly together.

Although there is agatized wood in all parts of the world, the writer believes there is none equal to some of this chalcedony as he cut a 10" diameter log, 18" long, in five pieces and was offered nearly one hundred dollars for it. He invites all interested in wood to stop and see his large collection of tons of wood in the rough, and polished.

Some Interesting Irregular Crystallizations In Geodes From Hamilton, Ill.

By WILLIAM C. McKINLEY

Hamilton, a city situated on the banks of the Mississippi River, in western Illinois, is not far from the famous geode locality of Warsaw (described by Dana, in his list of localities). Quartz geodes are most abundant at Hamilton, also, and the irregular crystallizations found in them are as interesting as the geodes themselves.

The most common irregular crystallization occurrence is that of the pseudo-crystallized chalcedony. In this instance, the crystals of the interior of the geode is covered by a thin layer of, usually, gray chalcedony, which covers completely all the crystallized surface . . . thus seeming to be composed only of chalcedony crystals. After one views the geode section from the side, however, the layer of chalcedony is noticed at once, and the illusion of crystallized chalcedony is disclosed. At times the layer of chalcedony is so thick that the crystal outlines are surpassed by botryoidal shapes taking their place. One special specimen is the result of ultra-secondary crystallization. Its interior has been acted upon by rock solutions, forming plates of semi-quartz (quartz-chalcedony). upon which, in turn, a layer of gray chalcedony was deposited.

Crystals of elongated marcasite are to be met with, rarely, in calcite geodes, forming the center of a solid geode.

In some quartz geodes, rounded calcite crystals sometimes occur, in a small clump usually.

Secondary crystallization of solid chalcedony geodes are to be met with, in which case the crystals of white quartz have a pleasant pearly-luster, due to twinning in the molecular planes.

Specimen Collecting In The West

By MR. and MRS. ROBERT F. HOWARD

With winter and its blanketing snows just around the corner in the majority of our states, there will, undoubtedly, be many of those who are interested in warmer weather, as well as minerals, that will spend at least a portion of the colder months in some of the more pleasant climates the southwest has to offer. Among these disciples of fair weather there will be many who have never gathered specimens in our great southwest before. Of those who have never had the experience of listening with bulging eyes and gaping mouths to tall tales spun by many of our western mining folk, a few timely words may save many a mile and dollar which would otherwise be spent in the pursuit of those gorgeously beautiful specimens which never exist except in the minds of the teller.

Although the telling of tall tales is probably practiced by miners throughout the world, I doubt very much if the great elaboration and profound sincerity with which these tales are told in our more western states can be excelled or even equalled any place. These assertions apply not only to that type of individual we occasionally meet in some isolated region, who is living and has lived for years practically the life of a hermit and for whom the next shovel full of gravel or the next round of shots is always the one which will make him his long-sought stake, it also applies to many of our "city-bred" miners who do their mining on paper and obtain their gold from other peoples' pockets

I have spent many a weary mile over the worst roads imaginable, and burned many a gallon of gasoline in search for specimens, the locations and existance of which undoubtedly did not exist outside of the mind of the pseudo mining engineer who so graciously passed out the information.

The meaning of these statements should not be misconstrued; it is not our intention to condemn as natural-born prevaricators all of the men to be met in the mining industry. As a matter of fact, our real mining men, who have taken their living from the earth by actual toil, are probably a finer group of individuals on the whole than are to be found in any other walk of life.

The search for and obtaining of choice specimens is in any case a rather difficult and expensive job; and it is only those of us who have learned to see and appreciate all of the wonders of nature who really obtain our "money's worth" on these quests.

Although I still occasionally "run down" one of these fantastic tales, (even though experience has taught me better), I have used one system which pays good dividends, and while it is not new, and may be subject to criticism, it probably is the best of any for a new-comer in a district whose funds are limited.

Collections, well arranged and labeled, whether private, state or institutional, are probably the best indications of the types of specimens that various districts have afforded. And strange as it may seem quite frequently the representative specimens in our state and institutional collections are not always the finest that districts have produced; secondly, a search through the most recent publications of the state mining bureau will give a fairly good indication of whether or not good material may be obtained from these localities.

For those who have more time and money to spend and who search for the rarer minerals, a few hours spent in the examination of the samples sent in for identification to the state bureau of mines itself will undoubtedly supply the key to many an interesting and little-known locality.

The Rainbow In The Rocks

By VERA ROOT SMITH

Elsie and I are art teachers, but I am afraid that we are crazier about rocks and minerals than we are about paintings and sculptures.

This obsession began about two years ago when our science professor at summer school gave us a piece of agate and a hunk of calcite. The calcite was whitish and translucent and one surface of it reflected light like a mirror. The agate was nearly opaque and yellow and so waxey that we liked the feel of it. Previously we had been mildly interested in rocks, but the gift of these two specimens set rolling a ball of enthusiasm that has grown as if it were made of soft snow. And succeeding events set this ball into a swifter motion until now there seems to be no stopping it. This enthusiasm, as it has gained momentum, has uncovered surprising things. We have found that our instincts to hunt, to fight, and to acquire, are not so far beyond the primitive stages as we had supposed. We have learned of unexpected resevoirs within ourselves of courage and industry on the one hand and of, alas, demoralizing desires on the other. We have spent time on our rocks and minerals which we should have spent on other things. We have been tempted to deceive and almost to thieve.

But we have saved money formerly wasted in more foolish recreations; we have been outdoors more, and we have had more thrills since we chose rocks and minerals for a hobby.

Soon after the gift from our teacher, we spent a week-end at Asbury Park. Here, among the pebbles, Elsie found a mottled grey-blue fragment. I was sure that it was man-made—part of a button or ornament. But Elsie did not agree with me and she clung to it and brought it home. Our professor told us that it was an especially nice bit of flint or jasper—probably a part of some Indian weapon or tool!

A few days later, a number of us went picnicing at Mohonk, and Elsie announced that she intended to find a fossil. She kept her eyes glued to the ground and narrowly escaped being lost several times because of her detours into what she thought was promising territory. As the day wore on, she persisted in her hunt despite the teasing at her expense—and when we returned to the cars, she proudly displayed a fossil trilobite!

Thus started our collections and thus began our demoralization as related to them. We gathered together the textbooks which we had purchased for use in our other college studies and exchanged them for a book on rocks and minerals. Then we proceeded to browse through this book to the neglect of the other subjects. The colored pictures and the descriptions in the book gave an added impetus to our enthusiasm.

At first we planned to have a collection jointly. But I insisted on having an "apartment house" collection (no specimen over an inch square). Elsie's fossil was nearly three by four, and all the king's horses and all the king's men could not have made her break it. So she started a collection to fit the fossil. In no time she had four collections—one of rocks, one of minerals, one of arrow-heads, etc., and one of fossils. My collection of rocks and minerals fits neatly into one box. I have but one fossil—a brachiopod about a quarter of an inch long and barely visible. Elsie makes great sport of this, but I treasure it because it is the only one I could find. I cannot see them even when they are all about me—but Elsie seems to smell them out everywhere.

Rock piles are irresistibly attractive to us. We have attacked roadside excavations and mine dumps with more zeal than a prison gang. While breaking stones, we have sat, stood, and lain on sharp rocks by the hour in the broiling summer sun. We've descended into the stone foundations of tumbledown buildings; we have waded through clumps of cruel blackberry bushes; we've scaled rocky precipices; braved pastures full of cows; explored

snake-infested old stone walls; and risked our lives in abandoned mines.

We like to discover our own specimens, but our desires go beyond what we alone can satisfy. My sister had some old rings and pins about the house and through a wily bartering I managed to secure for my collection some opals, a blood-stone, and a tiger's eye. We have learned that many non-collectors have odd bits which they have picked up during their travels and so we take care that everyone knows of our interest in stones. We present likely individuals with honeyed words, boxes of candy, and automobile rides; and by such unscrupulous means we have obtained some brain coral from Bermuda, some lava from Vesuvius, and a fern fossil from Canada. Several people have lent us collections for temporary study and it has taken much self control to return those collections intact. A bit of rosy rhodocrocite with a shining crystal of "fool's gold" in its center nearly made a thief of me. Frequently in the evening, one of us will get out the mineral book. Immediately the other is moved to look up something, and so a pleasant time follows, spent in study, in reminiscing, or in fighting for the possession of the book. Sometimes we spread our boxes of stones out in the kitchen and gloat over them like a couple of misers. It is strange—but after a nerve-wrecking day in school, we can pound rocks all evening (getting them into uniform sizes) and then go to bed, happy and wholly relaxed, to sleep like tops.

We love the feel and luster and color of our minerals. We have a rainbow—and more—among them. There is rose-red cinnabar, the ore of mercury. There is gleaming yellow chalcopyrite and salmon-colored feldspar. There's a bit of polished mottled-yellow jasper and a fragment of silky grass-green malachite. There are pieces of delicate rose quartz, and aquamarine, and lilac lepidolite. There's a piece of red hematite with my first initial perfectly formed upon it, and there's the bit of tarnished bornite that is a rainbow in itself.

The collection of our rock rainbow has thrilled us again and again. Once we found an old road literally covered with well-formed garnet crystals. In a heap of granitic rock we found bits of amazonite of robin's-egg-blue. In the heart of a rusty mass, we have been startled by the sunshine of "fool's gold." And we have turned over a clump of dirty rock to find underneath a little forest of clear rock crystals!

Mineral hunting may be a trifle demoralizing, but it is cheap and exciting and healthful. As a hobby, I wondor if it would not bring much peace and joy to many who have not yet found the rainbow in the rocks.

Mineral Oddities

Building stone is almost any hard solid which stands up under the weather. Most of us have read of the coquina rock of the West Indies and Florida, which is soft and pasty when dug, but which hardens into a beautiful white stone on exposure to the weather. Another similar type of rock is found in lookout and neighboring mountains in north Alabama. It is a sandstone, with a calcitic and iron cement, varying in color from grey to red. When dug the rock is soft enough to be cut to size with an ordinary cross-cut saw or hued to shape with an axe, both without injury to the keen edge of the tool. But it it stands three days in the open air it becomes necessary to use regulation rock tools to work it into shape.

GILBERT HART.
Piedmont, Alabama.

Phosphorescent Stalactites

By W. R. Von DEITSCH

One summer, not so many years ago, a young lady attending the Barrington School for Girls, at Great Barrington, Mass., in company with some girl friends, started on an exploring tour of the school cellars. It was in no sense a scientific expedition, but in a subcellar they discovered some stalactites hanging from the ceiling. These were about two inches long, and when broken off were found to be hollow and fragile. They are now among other specimens of the author's collection. The stalactites are white, the usual color, and show no reaction under the argon bulb. But when the light is extinguished, they glow with a pale green phosphorescence, which is best seen in a very dark room. This, however, soon fades away.

The Barrington School was once a mansion, erected over a half century ago. In later years it was taken over by the town and turned into a school for girls.

Collector's Kinks

Collectors are cordially invited to submit notes from their experiences and so make this department of interest to all.

Magnetic properties are often of determinative use. Lodestone is the only mineral (except perhaps native iron) which possesses polarity and the power of attracting iron; but several minerals can be attracted by a strong magnet. A much longer list can be made of minerals which are feebly magnetic, and for instance, can be separated from their gangue by the powerful electromagnets. Such minerals are usually reported in descriptions as "feebly magnetic"; and are usually entirely inert to the common magnet. When playing around with a sample of wolframite, one of these feebly magnetic minerals, I discovered that its magnetic property could be discovered with a compass. A delicate compass with a 4" needle or larger, and with the glass cover plate close to the needle, is carefully levelled and the needle released. The mineral is then placed on the cover-glass close to one of the ends. A slight displacement of the mineral will show a similar slight displacement of the needle. A surveyor's compass, or the needle in a transit make excellent testing machines, because of the delicacy of the needle, its length, and the graduations of the circle which allow the observer to note even the smallest displacement of the needle by the suspected mineral.

GILBERT HART

Piedmont, Alabama.

MINERALOGICAL QUIZ

(Answers on Page 11)

1. What mineralogical magazine was published twenty-five years or more ago?
2. For how many years was it issued?
3. Who was its Editor?
4. How often was it issued?
5. What was its circulation?
6. Why was it a failure?
7. Why, if a losing venture, was it continued so long?
8. Why will not collectors generally support a magazine published in their interests?

Diamond Finds In The United States

By EUGENE W. BLANK, *Scientific Editor "Rocks and Minerals"*
Colgate-Palmolive-Peet Company, Jersey City, N. J.

PART IV.

DIAMONDS IN ARKANSAS (Continued)

A specimen of the matrix containing a diamond found in 1907, was examined by George F. Kunz and H. S. Washington who made the statement that: " . . . the diamond is actually in place in the rock and was not inserted in the specimen. Consequently it constitutes a definite proof that the peridotite is the source of the diamonds."[50] Much subsequent work has been done and it is generally believed that the peridotite rock of Arkansas is similar in character and mode of occurrence to that of South Africa.

These similarities can be well emphasized by tabulating their principal characteristics.[51]

Characteristics of Kimberlites of Arkansas and South Africa

1 Kimberlite (peridotite) of Arkansas

Phenocrysts:
- 40 to 50% olivine
- Olivine low in FeO
- A little phlogopite
- Pyrope, almandite, and melanite

Groundmass:
- 50 to 60% phlogopite

Important Accessory minerals:
- Augite, perovskite, chromite, and iron ores.

Habit:
- Lamprophyric.

2 Micaceous Kimberlite of South Africa

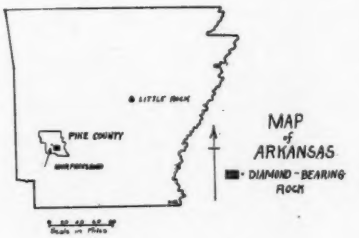
Phenocrysts:
- 50 to 75% olivine
- Olivine low in FeO
- A little phlogopite
- Pyrope

Groundmass:
- As much as 50% phlogopite

Important Accessory minerals:
- Augite, perovskite chromite, and iron ores.

Habit:
- Lamprophyric

The Arkansas Diamond Company purchased the Huddleston property, prospected it and had numerous pits dug and drill holes put down. In May, 1908, the company erected a small diamond washing plant at the southern edge of the area and in August, 1909, increased the size of the plant. Operation was continuous to 1912 after which operations ceased until 1919 when the



50 Miser and Ross, "Diamond-Bearing Peridotite in Pike County, Arkansas," U. S. Geological Survey Bulletin No. 735-I, Washington (1923). Information is included in this report relative to diamond production up to 1921.

51 Ibid., p. 315.

company was reorganized as the Arkansas Diamond Corporation with an authorized capital of $10,000,000. In 1920 a larger washing plant was erected near the first one. According to John Peay, of the Arkansas Diamond Corporation, this plant operated for a total of nine months and handled approximately 18,000 loads of peridotite, each load containing sixteen cubic feet of material.[52] This plant has not been in operation for several years.

The Huddleston property includes approximately forty-nine acres of the main peridotite pipe, the remainder of the area is made up of the Mauney tract, which includes about eight acres, and the Austin Q. Millar tract, consisting of three acres. The Mauney tract was operated on a small scale for several years until the Kimberlite Diamond Mining and Washing Company obtained a lease on the mine. The plant was in operation from 1913 until 1919 when it was destroyed by fire.

The Austin Q. Millar tract was first operated by the Ozark Diamond Mines Corporation in 1912. In 1914 the plant was sold by a receiver to the Kimberlite Diamond Mining and Washing Company and was operated by the latter company until the fire of 1919.

The Kimberlite area has been prospected but no washing has been done. Several stones are reported to have been found on the surface. On the American area twenty-four stones have been reported found on the surface, one of which weighed 3 11/16 carats. The Black Lick area has been but little prospected and no diamonds have been found.

Nearly all the diamonds discovered have been found within the exposures of the typical peridotite though a few have been picked up in streams where they had probably been carried by the processes of weathering and erosion. Five diamonds are reported to have been found at a locality on Mine Creek, 3 miles south of Corinth. The diamonds have been found on the surface and to depths as great as twenty feet. Just how much further in depth diamonds may be found will remain unknown so long as the prospecting operations are confined to surface workings.

Geology

Three general types of peridotite are found in the outcrop area. These are (1) the porphyritic intrusive peridotite, (2) the volcanic breccia, and (3) the tuffs and fine grained breccias.

52 Branner, "Outlines of Arkansas Mineral Resources." Published jointly by the Bureau of Mines, Manufactures and Agriculture and State Geological Survey, Little Rock, Arkansas (1927)

G. C. Branner, Photo.

Plant of the Arkansas Diamond Corporation near Murfreesboro, Arkansas

The Prairie Creek area and the Kimberlite area are composed principally of the porphyritic intrusive peridotite. The fresh rock is exceedingly hard and tough and is known to the miners in virtue of this property as "hardebank." On fresh fractures the rock shows green, brown or black. The weathered rock invariably shows deep pits in its surface. Olivine forms the only phenocrysts of appreciable size. Only a few diamonds have been found in this material.

The volcanic breccia is composed of cemented fragments of the porphyritic type of peridotite, shale and sandstone. Most of the fragments are less than an inch in length. It is the surface rock over a large area in the Prairie Creek dike and extends from the southern portions of the Ozark and Mauney mines southward to the Arkansas mine and beyond. It has produced nearly all of the diamonds so far mined. On exposure to the air the breccia weathers to a yellowish green and is known as "green ground" or "blue ground."

The tuffs and fine-grained breccias compose the smallest portion of the peridotite in the Prairie Creek district. The rocks are light blue-gray and hard varying considerably in texture. No diamonds have been found in this material.

The peridotite areas occur approximately six miles south of the northern edge of the Coastal Plain area of southwestern Arkansas. The peridotite is believed to be of the same age as the Tokio member of the Bingen formation, upper cretaceous, because of the peridotite fragments in the lower beds of the Bingen formation. A portion of the Bingen bed overlies the peridotite in the American and Black Lick areas presenting an additional proof that the age of the intrusion is not older than Bingen times.

Characteristics of the Arkansas Diamonds

Most of the diamonds that have been found are quite small; as many as 250 of them would be required to weigh 1 carat. There have been, however, a few exceptional finds, several stones having been found weighing approximately 17 to 20 carats.

The greater number of the diamonds are white, yellow or brown in color. The larger stones are of an exceedingly high grade in color, brilliancy and freedom from flaws. Several yellow diamonds of a superb color and quality have been unearthed. Kunz[53] says: in describing several yellow, brown and white stones from the Arkansas mine: "These are absolutely perfect and are equal to the finest stones found at the Jagersfontein mine, or that were ever found in India."

53 Kunz, "Precious Stones: Mineral Industry during 1918," Vol. 27, 621 (1919).

G. C. Branner, Photo.

Open Cut of the Arkansas Diamond Corporation near Murfreesboro, Arkansas

According to Kunz and Washington[54] the forms of the first 140 diamonds found are as follows:

"The most common forms are distorted hexoctahedrons—most of them elongated but others flattened—with much rounded faces. There are a few regular and undistorted octahedrons that show slightly rounded faces, though in most of these the center is flat. Many of the edges are replaced by dodecahedrons, and some of them are further rounded by trigonal trisoctahedrons, with hexoctahedrons near the apices. No cubes were seen, and tetrahexahedral and dodecahedral forms seem to be rare, except as they replace octahedral edges and angles."

According to Austin Q. Miller of the Kimberlite Mining and Washing Company, which operates the Ozark and Mauney mines, the percentage yield of the various kinds of stones are as follows: White stones, 40; yellow, 22; brown, 37; true bort, 1.

Continuing, he says: "Because of the high luster in their rough state, a parcel of Pike County diamonds are unmatchable by a like parcel of African stones. This quality is largely due to their extreme hardness, and as a consequence the greater brilliancy of the finished gem is the result. In both hardness and size the mine-run stones are best comparable to the Brazilian diamonds.

"Their crystallographic characteristics are distinct. As the larger proportion of the recoveries belong to the more complex forms of the isometric system, the trisoctahedron and hexoctahedron predominate more than the octahedron or dodecahedron. Rarely are crystals recovered that present sharp, angular faces, the characteristic rounded (convexed) surfaces greatly predominating. The true bort is translucent, with a radial structure, and occurs in rounded forms.

"Stones have been found with a blue or pink tinge, and occasionally a "frosted" or etched white is noticeable in the "recoveries".[55]

Production of Arkansas Diamonds

Altogether five mines have been operated: the Arkansas, the Ozark, the Mauney, the American and the Kimberlite. The Arkansas mine has been the chief producer, having recovered about 3,000 diamonds up till the end of 1920. The mine was again operated in 1921 for a short period of time but the production figures are unavailable. The Ozark mine ranks second in regard to production having yielded 800 to 900 diamonds in 1913. It was again worked from 1914 to January, 1919, but as in the former case the production is unknown. Most of the diamonds are being held by the mining companies but estimates of the total number produced range from 5,300 to approximately 10,000 stones.

The Arkansas Diamond Corporation, successor to the Arkansas Diamond Company, recovered from the Arkansas mine a total of 2,544.39 carats from April, 1923 to June, 1925. At a value of $5.00 per carat, the total production for this period of time is valued at approximately $12,721.

According to Fuller[56] the total number of diamonds recovered from the Arkansas area up to 1909 was 540. Of these 540 stones, 505 weighed 217 carats, or an average of approximately one-half carat each. The largest stone found up until that time weighed six and one-half carats. Most of the stones were white and several were of unexcetional brilliancy and color. Three stones were cut and were valued at $60.00 to $175.00 per carat. According to Fuller tests run from certain portions of the Arkansas pipe indicate at least 0.21 carats per load of 16 cubic feet, which may be considered a most excellent average if it can be maintained.

54 Kunz and Washington, "Note on the forms of Arkansas Diamonds," Am. Jour. Sci., Vol. 24, 275 (1907).

55 See reference 50, p. 320.

56 Fuller, "Diamond Mining in Pike County, Arkansas," Eng. and Mining J., Vol. 87, 152 (1909).

To be Continued

Personal Greetings

We are always pleased to meet our friends when they are traveling this way. Among those who called on us recently were:

Mr. and Mrs. Allison Albee, of Rye, N. Y.

Dr. and Mrs. Clinton P. McCord, of Albany, N. Y.

Mr. Ernest Weidhaas, of Pelham, N.Y.

Mr. Ramon Conover, of Kyserike, N.Y.

Mr. and Mrs. Henry Thurston and daughter, Miss Jane, of Montrose, N.Y.

Mr. and Mrs. J. Miller and daughter, Miss Violet, of Brooklyn, N. Y.

Mr. and Mrs. Carl Klein, of Hudson, N. Y.

Miss Elsie Nourse, of Mt. Vernon, N. Y.

Miss Vera Smith, of Wallingford, Conn.

Mr. and Mrs. W. H. Otersen, of West Haven, Conn.

Messrs, Alverton Higgins, Guy Baker, H. L. Chandler, Edward Allison, Sr. and Edward Allison, Jr., all of Springfield, Vt.

Dr. Lloyd Fisher, of Lewiston, Maine

David M. Seaman, of Pittsburgh, Pa.

Andrew Moyer of Takoma Park, Md.

Leon Sheldon, of Frostproof, Fla.

W. T. O'Gara, of Fort Worth, Texas.

Acknowledgments

We wish to acknowledge receipt and express our sincere thanks for specimens and other donations recently sent us by some of our subscribers.

John E. Kitson of Easthampton, Mass., two interesting snap-shots of fossil tracks.

Karl Proctor Perry of Hartford, Conn., two photographs taken on a mineralogical jaunt.

Miss Evelyn Glantz of Brooklyn, N. Y., three photographs of geological formations.

Wm. C. Chandler of Chico, Calif., nine photographs of California scenery, mineral localities and geological formations.

P. L. Forbes, of Stauffer, Oregon, a large assortment of the very interesting iridescent obsidian from his vicinity.

Wibur Shuee of Caldwell, Idaho, some specimens of a very interesting opal in a devitrified perlite.

Frank Duncan of Terlingua, Texas, some interesting specimens of the very fine cinnabar that occurs there.

E. C. Cline of San Bernardino, Calif., a cut and polished specimen of tourmalinated quartz from Riverside Co., Calif.

Jorge Morlon of Havana, Cuba, an interesting marble specimen from the Isle of Pines, Cuba.

Dr. Clinton P. McCord, Albany, N. Y., a number of interesting specimens from around his city.

Mr. Allison Albee of Rye, N. Y., a number of interesting photographs of some iron mines in Putnam County, N. Y.

Mr. Emmet Doherty, of the Stone Studio, Peekskill, N. Y., a number of interesting photographs from the former location of Rocks and Minerals.

MINERALOGY QUIZ—Answers

(Questions on Page 6)

1. The Mineral Collector.
2. First issued March 1894—expired Feb. 1909.
3. Arthur Chamberlain.
4. A monthly, the subscription price being $1.00 a year.
5. It is said it never exceeded 300 copies a month.
6. Because of absolute lack of support by collectors.
7. Mr. Chamberlain was a printer, an enthusiastic mineralogist and printed the magazine himself. Hope of securing a large circulation died first. The death of the publication followed shortly afterwards.
8. One of the unsolvable mysteries of the universe.

The Amateur Lapidary

Conducted by J. H. HOWARD*

504 Crescent Ave., Greenville, S. C.

Amateur and professional lapidaries are cordially invited to submit contributions and so make this department of interest to all.

*Author of—*The Working of Semi-Precious Stones.* A practical guide-book written in non-technical language for those who desire to cut and polish semi-precious stones.

Polishing Flats

By J. H. HOWARD

I have never polished any flats larger than about 4" dia. Such flats are usualy of agate and the procedure outlined here is for stones of that hardness. I do this job as follows:

Saw stone to thickness required with diamond saw. This cuts much cleaner than the mud saw and leaves very little grinding to bring the specimen to a flat..

Grind flat on the side of a 10" cast iron lap using paste of FF carborundum. If the specimen is considerably out of true it will pay to first use No. 150 carbo. Speed about 800 rpm.

Grind further with No. 600 carbo on cast iron lap until the stone when dry presents a uniform appearance over all the ground surface.

The first smoothing is done on the periphery of a maple wheel 10" dia. x 2" thick using paste of FF carbo. Speed about 400 rpm. Pressure heavy. Again continue until all the surface is uniformly smooth when dry.

The first polish is done on the periphery of a hard felt wheel 6" x 1" with a paste of either tripoli or pumice to which has been added about 10 per cent of No. 600 carbo. Speed 400 rpm. Pressure heavy.

The final polish on similar felt wheel with tin oxide.

Notes. Use hardest felt wheel. Specified by the makers as "D". Often called "rock hard."

In grinding or polishing on the periphery of a wheel it is necessary to keep the specimen moving else the surface will be worked into hills and valleys. It doesn't take long for one to learn just what motions are best suited to the prevention of this and to avoid scraping the abrasive off the wheel with one edge of the specimen.

Renton had an article in the Oregon Mineralogist. It outlined his procedure for this work, in detail. The rough outline is as follows:

Saw with diamond or mud saw.

Grind flat on a cast iron lap with paste of No. 100 or No. 150 carbo. Speed about 700 rpm.

Wash carefully and grind on cast iron lap with No. 220 or No. F carbo. Let lap run slightly dry and remove stone from lap before it begins to "drag."

Wash again and repeat with No. 400 carbo.

Next, buff on the periphery of a hard felt wheel with No. F carbo. Speed about 350 rpm.

Then a first polish with tripoli on the periphery of a hard felt wheel.

Then, if finest finish is desired, use tin oxide on a periphery of hard felt wheel.

It is noticeable that the only material difference between the systems used by Renton and this writer, is that on one particular step Renton uses No. F

carbo on hard felt while the writer uses No. FF carbo on a wood wheel.

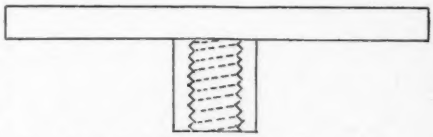
Dake also had a paper in the Oregon Mineralogist, on this same subject. He grinds to flat with No. 60 carbo on iron lap. Then smoothes with No. FFF carbo on iron lap. He omits the step which Renton does with carbo on hard felt and which the writer does with carbo on wood, and goes immediately to tripoli on felt or canvas. He glues the felt or canvas to the side of the iron lap and polishes on this flat surface. He suggests that discarded Sampson cloth from billiard tables is good for this purpose but notes that it is better to use felt about ¼" thick.

He recommends a lens grinding machine with vertical shaft such as is used by manufacturing opticians. This may be had equipped with flat laps and as the design is such that no arbor or arbor nut protrudes through the lap, the whole surface is available for use and flats up to 10" diameter can be polished on a 10" lap. This type of lap is certainly of decided advantage. However, the same results can be gotten by having laps specially made, of the "face plate" type, for the ordinary bench grinder.

I know of other users who are adherents of this system. Some of them modify it to the extent of having a slight "crown" on the lap to which the felt is glued. This makes it possible to concentrate effort on low, slow polishing spots on a large flat.

A glance at the accompanying chart will acquaint the worker with the whole requirements of each method and enable him to determine which of them he can use to best advantage and with a minimum outlay for equipment he doesn't already have.

Going back for a moment to the matter of type of flat lap. If one proposes to polish large slabs above about 4" dia. it is almost essential that he have the type of lap in which the arbor does not project. Otherwise the laps must be more than twice the diameter of the slab to be polished. Such laps can be made by any good machine shop. See sketch. It is essentially nothing but a face plate. I suggest that two of them be made for grinding. One for the coarse grinding and one for the fine grinding. And that a third one be made and provided with several holes out near the edge. This one to have wood discs screwed to it and the felt or canvas glued to the wood discs. This enables one to use the same face plate for several grades of abrasive either with plain wood surface or with felt or canvas glued to each of several wood discs.



Cast Iron Face Plate for Grinding Flats

COMPARATIVE ROUTINES FOR POLISHING FLATS

	DAKE	RENTON	HOWARD
First Step	No. 60 carbo. Iron lap.	No. 100 or 150 carbo. Iron lap.	No. 150 carbo. Iron lap.
Second Step	No. FFF carbo. Iron lap.	No. 220 or F carbo. Iron lap.	No. FF carbo Iron lap.
Third Step	Tripoli on flat side of felt wheel.	No. 400 carbo. Iron lap.	No. 600 carbo. Iron lap.
Fourth Step		No. F carbo. Periphery of felt wheel.	No. FF carbo. Periphery of wood wheel
Fifth Step		Tripoli. Periphery of felt wheel.	Tripoli or Pumice. Periphery of felt wheel.
Sixth Step		Tin Oxide. Periphery of felt wheel.	Tin Oxide. Periphery of felt wheel.

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Getting Acquainted With Minerals

By GEORGE LETCHWORTH ENGLISH, 324 pages, 258 illustrations. Published by Mineralogical Publishing Company, Rochester, N. Y.

Reviewed by H. Alban Anderson

Mr. English's book quite justifies the title. Even a cursory reading makes one feel one has at least a bowing acquaintance with some of the members of the mineral kingdom, while an acquisition of a more comprehensive knowledge of the contents should make one a well-informed amateur mineralogist, with a substantial foundation for more advanced and technical study—if one desires to go further. But going further is apparently not the immediate concern of the author. His purpose is to awaken in more people an enthusiastic interest in the mineral kingdom and, by reducing to a minimum the knowledge necessary to enter therein, to dispel the idea that one must first know all a text book has to offer, before he can enjoy collecting and be able to identify specimens he may find. It is really surprising how little this knowledge need be—or is it that Mr. English tells it so simply one does not realize it is so much? But simplicity is a charming characteristic of the book. It can be read and understood by anyone, from the youth in junior high school to the grandfather after whom he is named.

The reader will find it difficult to escape Mr. English's own enthusiasm. The very first chapter, "Why Study Minerals?" stimulates an active interest, a desire to be up and at it; but in the very next chapter Mr. English says:

"Before you start out to collect or to study minerals, make up your mind that you are not going to be a quitter. It is foolish to begin and in a short time drop it. You would better not begin at all. Mineral collecting and mineral study are too delightful to fall into the hands of anyone who will not treat them rightly. Throw all of your enthusiasm into both collecting and studying and they will soon justify any expenditure of time and money you may be able to make upon them."

Excellent words of admonition, advice and encouragement!

The book contains three parts, two appendices and a general index. Part I covers what the amateur collector should know before he goes into a quarry, mine or rock cut in search of specimens, with such interesting additional chapters as "Of What is a Mineral Made?" wherein is told why some elements are willing, some unwilling to unite with others in mineral combinations; "Contacts of Light and Minerals," "Fluorescence," and chapters with such whimsical headings as "The Pranks of Crystals" and "Mineral Mimics."

Part II is devoted to a "Description of Minerals." And here Mr. English has made a most commendable classification for the amateur. Departing from the Dana System, which classifies minerals under their sulphates, silicates, oxides, etc., Mr. English lists the combining forms under the predominating element. For example: Sphalerite, zinc sulphide; Smithsonite, zinc carbonate; Willemite, zinc silicate, etc., are found under "Zinc Minerals," a much more satisfactory and informative arrangement for the beginner. The descriptive text also gives the names of valuable ores, the uses of minerals with a commercial value, and the noted localities where they are found.

Part III discusses briefly the igneous, sedimentary and metamorphic rocks, those more or less shapeless masses that form the crust of the earth.

Appendix I consists of tables helpful in identifying minerals, and Appendix II is a very much needed guide to the correct pronounciation of mineral names, some of which are persistently mispronounced by many mineralogists, who should know better.

Many fine illustrations add greatly to the interest.

Altogether "Getting Acquainted with Minerals" is a book to be recommended to anybody. Mr. English says in his Preface: "The aim of this book is to introduce the charming science of mineralogy in the simplest and most interesting manner, without sacrificing scientific accuracy." And the book hits the mark at which it is aimed.